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Shelf Life Extension of Walnut Kernels using Rice Starch-based Edible Coating Formulations

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ABSTRACT

The shelf life of raw walnut kernel is limited due to the influenced of various factors such as its chemical composition, storage condition and environments etc. The effects of five different rice starch-based edible coating formulations on the chemical, physicochemical and textural properties of coated walnut kernels were studied. The peroxide value,anisidine value,totox value, free fatty acidcontent, hexanal content, color, moisture content, and textural properties were monitored in coated walnuts stored at accelerated temperature (60°C). Results indicated that the coated walnuts had a better quality in terms oxidative stability based on all the chemical indicators of rancidity, and a firmer texture when compared to the uncoated ones, even after 20 days of storage at high temperature. The walnut kernels that were coated with the basic rice starch formulation can be stored longer than the uncoated control samples i.e. with additional of 6 to7 days at 60°C. However, the color of the coated sample was significantly ($P \leq 0.05$) lighter than the control group with L values of 49.86 and 46.88, respectively. The predicted shelf life based on calculation showed that the shelf life of the walnut kernels can be extended to 1024 days from 160 days at storage temperature of $20 \pm 2^\circ\text{C}$.It can be concluded that the physicochemical and storage qualities of walnut kernels can be improved by addition of palm oil or chitosan to the rice starch-based edible coating formulations.

Keywords: *walnut, stability, coating, chitosan, rancidity, fracturability*